Dynamic response of linear mechanical systems : modeling, analysis and simulation

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Abstrak

This book can be utilized for a variety of courses, including junior and senior-level vibration and linear mechanical analysis courses. The author connects, by means of a rigorous, yet intuitive approach, the theory of vibration with the more general theory of systems. The book features : aseven-step modeling technique that helps structure the rather unstructured process of mechanical-system modeling, a system-theoretic approach to deriving the time response of the linear mathematical models of mechanical systems, the modal analysis and the time response of two-degree-of-freedom systems. The first step on the long way to the more elaborate study of multi-degree-of-freedom systems, using the Mohr circle, simple, yet powerful simulation algorithms that exploit the linearity of the system for both single- and multi-degree-of-freedom systems, examples and exercises that rely on modern computational toolboxes for both numerical and symbolic computations as well as a Solutions Manual for instructors, with complete solutions of a sample of end-of-chapter exercises. Chapters 3 and 7, on simulation, include in each "Exercises" section a set of miniprojects that require code-writing to implement the algorithms developed in these chapters.